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JULY 30, 1949

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Map-Makers Aloft

See Page 73

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VOL. 56 PAGES 65-80

RCA Laboratories developed a copper mesh with 2,250,000 tiny openings to the square inch for the television camera "eye."

You get **finer television pictures** through this super-fine mesh

In RCA Image Orthicon television cameras you will find a super-fine copper mesh. Until a new technique for making such screen was discovered at RCA Laboratories, only coarse and irregular mesh—which obstructed 60% of the picture—was available.

Today, through RCA research, such mesh can be made with 1500 gossamer wires to the linear inch. An ordinary pinhead will cover about 7000 of its tiny openings.

By RCA's technique—now producing commercial quantities of 200- and 500-mesh screens—the mesh is so fine, so regular in structure, that it is invisible on home television receivers . . . and as much as 85% more television picture passes through.

You benefit—many times

This new type of super-fine wire mesh, and the technique for making it, like most major developments in all-electronic television, is another RCA Laboratories *first*. Leadership in science and engineering adds *value beyond price* to any product or service of RCA and RCA Victor.

* * *

The newest developments in radio, television, and electronics may be seen in action at RCA Exhibition Hall, 36 West 49th Street, N. Y. Admission is free, and you are cordially invited. Radio Corporation of America, Radio City, N. Y. 20.

RCA

RADIO CORPORATION of AMERICA

World Leader in Radio—First in Television

MEDICINE

Cancer Treatment Test

The ratio of the amount of two chemicals in the blood reveals the effectiveness of a cancer treatment and also shows the progress that cancer patients make.

▶ A BLOOD test that will tell within 24 hours whether a new cancer treatment is going to be effective or not has been developed by Dr. P. M. West and Jessamine Hilliard of the University of California at Los Angeles Medical School in cooperation with the Birmingham Veterans Administration Hospital.

A second feature of the test, its ability to show the progress of individual cancer patients, has already led to its being adopted as a standard procedure at the Birmingham Hospital. Any change in the patient's condition, whether accelerated spread of the cancer or sudden development of resistance, is promptly detected by the method.

The test involves charting the ratio of the amount of two chemicals in the blood. The chemicals are enzyme inhibitors, so-called because they slow down the action of enzymes. Familiar example of an enzyme is pepsin which helps digestion of food in the stomach. The many other enzymes of the body play equally important parts in body chemical processes.

The enzymes concerned in the cancer treatment test are rennin and chymotrypsin. The concentration of the chymotrypsin slow-downer, or inhibitor, is directly related to tumor growth, while the concentration of the rennin inhibitor reflects the resistance of the patient.

When cancer treatment is effective, the concentration of the rennin inhibitor is elevated well above that of the chymotrypsin inhibitor. When the treatment is not effective and the patient is failing, the chymotrypsin inhibitor rises sharply and the rennin inhibitor drops to a low level.

Unusual growth, such as occurs not only in cancer but in post-surgical cases, pregnancy and many infections, also affects the two inhibitors. The test, therefore, is never interpreted in terms of tumor growth unless interfering complications are absent. The test is not for cancer itself, and is not used unless a diagnosis of cancer has been made by the usual methods.

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AERONAUTICS

Suction Slots Reduce Drag

▶ AMERICAN planes of the Flying-Wing type may soon have long slots extending along the wing surface through which air will be sucked into the plane from the outer layer close to the surface, the so-called boundary layer which causes heavy drag. Research looking forward to use of such slots is well along by engineers of Northrop Aircraft, Inc., Hawthorne, Calif., makers of the present Flying Wings.

Scientists describe the boundary layer as the blanket of air made up of paper-thin layers which slide over each other immediately adjacent to the surface of an airplane in flight. This air envelope develops miniature eddies and turbulences, which claw at the surface of the airplane, creating a large part of the drag which holds the plane back.

The idea behind the use of slots on the wings to remove part of the boundary layer and thus decrease drag is not new. The British, late in 1947, announced a twin-jet flying wing type of plane already at that time making flight tests which had a slot running spanwise across a large part of the wing through which boundary layer air was sucked.

The National Advisory Committee for Aeronautics, in its laboratories and wind tunnels at Langley Field, Va., has carried out considerable research on the slotted wing and has already issued a report indicating its belief that the method offers substantial improvement on thick, high-lift wings. The research is directed toward the reduction of drag in the relatively thin-section wings characteristic of modern, high-speed airplanes to extend their range.

Northrop's research program is directed toward controlling the boundary layer by means of narrow slots arranged in ranks. A pump in the airplane creates suction in the slots, whisking off the boundary layer air into the plane itself, and exhausting it behind. By continually drawing off the lower boundary layer air the heavy "build up" which leads to drag-inducing turbulence is avoided, and the atmospheric blanket which surrounds the airplane remains thin and smooth.

With the use of slots on the wings of planes of the Flying Wing type, decreased drag will save much fuel and give the aircraft far greater range. Northrop states that its engineers think that a Flying Wing so equipped could be operated on one-fourth the power required for a similar airplane not so equipped. These engineers estimate that the B-49 Flying Wing, with boundary layer control, could make a non-stop flight, without refueling, around the earth at the equator.

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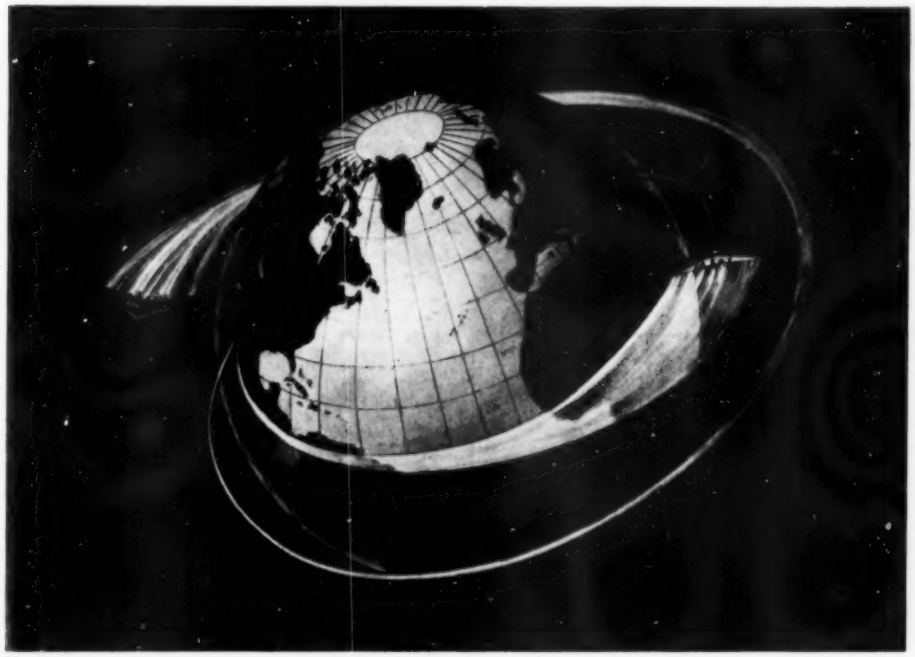

ROUND-THE-WORLD RANGE—Flying Wings equipped with boundary layer control which reduces drag would be capable of flying non-stop around the globe, returning to the take-off point without refueling. This drawing illustrates the possible increase in range with this device although Flying Wings incorporating this device are not being built at present.

PSYCHOLOGY

Confirm Opposites Attract

➤ IN picking a wife or a husband, the old saying that "Opposites attract," holds good. This is confirmed in a study of 271 couples by Dr. Horace Gray, of the Stanford University School of Medicine.

Each husband and wife was classified according to Jung's psychological types. A person's interests may be turned inward toward the world of his own thoughts and feelings, or he may be interested primarily in other people and in things. His way of perceiving things may be by his faculties of sensation or by intuition. His judgments may be based on thinking or on feeling.

In only 40 couples, 15% of the group studied, were husband and wife alike in all three respects. In another 15% they were straight opposites—different in all three respects.

Most common picture was that of the extravert-sensation-thinking husband married to an extravert-sensation-feeling wife. Couples that are alike in two respects and complementary in one make up 38% of the group.

The attraction is greatest in the field of attitude, i.e., between introverts and extraverts; 61% were opposite in this regard. Next the mutual allure between marriage partners was greatest in the aspect of judgment; 59% were opposite in that one was of the thinking type and the other feeling. The pull of opposites in the field of perception, that is, between sensation and intuition types was lowest, affecting only 52%.

Intuition, despite the popular idea that it facilitates human understanding, may actually be a handicap to getting and staying married, Dr. Gray found.

Single people, he observed, are more often intuitive than are married people. And divorced people are more often of the intuitive type than are the married or the widowed.

Dr. Gray warns against condemning any particular type. Each type has its usefulness, he says, and each has its limitations. Intelligence has nothing to do with any type. And neither has emotion; there is little evidence to support the common notion among feeling-type people that their emotions and humanity are somehow more sensitive than in thinking-type people.

Details of Dr. Gray's study are reported in the JOURNAL OF SOCIAL PSYCHOLOGY (May).

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GEOLOGY

Commercial Lode Tin Not Found in Alaska

➤ THERE is tin in Alaska, probably not much, but enough to warrant a government survey. A report on it is now available. No lode tin of commercial grade was found in the district investigated, but an appreciable amount of placer tin still remains in the Potato mountain tin placer district, the report states.

This district is near the tip of Seward peninsula and is just across the Bering strait from Siberia. It produced some 1,500 tons of tin concentrates in the first two decades of the present century, but none since. It is one of the few places on the North American continent where tin has ever been mined commercially. The United States is dependent on foreign countries for this vastly important and widely used strategic and industrial metal, supplies coming principally from Bolivia and the Far East.

The investigation and report are work of the U. S. Bureau of Mines. Copies of the findings are available without cost from the Bureau of Mines, 4800 Forbes St., Pittsburgh. The title is INVESTIGATION OF POTATO MOUNTAIN TIN PLACER DEPOSITS, SEWARD PENINSULA, NORTHWESTERN ALASKA.

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● RADIO

Saturday, August 6, 3:15 p. m., EDST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. J. E. Hobson, director of Stanford Research Institute, Palo Alto, Calif., will talk about "Food from Algae."

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PSYCHOLOGY

Claim We Are Misled

Lack of love and understanding toward others in world leaders is attacked by a scientist who sees humanity doomed unless new human values are adopted.

➤ THE world's leaders are misleading us. So declared Dr. M. F. Ashley Montagu, physical anthropologist of Hahnemann Medical College and Hospital, Philadelphia, Pa.

"Our world at the present time," he says in a report to the JOURNAL OF SOCIAL PSYCHOLOGY (May), "is largely directed by criminally irresponsible adventurers and cynical and complacent men who have grown old in the ways of self-interest and ultranationalism. Unless their place is taken by men of understanding and humility whose guiding principle is love, the world of man is doomed."

"Men who do not love one another are sick," declared Dr. Montagu.

"They are sick," he explains, "not from any sickness arising within themselves, but from a sickness which the malorganization of their societies has thrust upon them.

"The belief in false values, in competition instead of cooperation, in class and race and national prejudice instead of love, in narrow selfish interests instead of altruism, in atomism (especially atombombism) instead of universalism, in the value of the dollar instead of the value of man, represents social man turning upon all that is biologically good in him."

Love and cooperation among men as natural states have a support in the findings of biological sciences, Dr. Montagu shows.

Cooperation is essential to survival, he declares.

The habit of thinking of evolution in terms of the struggle for existence in which the fittest are alone selected for survival while the weakest are ruthlessly condemned to extinction is not only an incorrect view of the facts, but is a habit of thought which has done a considerable amount of harm, Dr. Montagu says.

Certainly, aggressiveness does exist in nature, he explains, but there is also a healthy non-ruthless competition, and there also exist strong drives towards social and cooperative behavior. These forces do not operate independently but together, as a whole, and the evidence strongly indicates that of all these drives the principle of cooperation is the most dominant, and biologically the most important.

Even planarian worms, Dr. Montagu has found, help each other to survive damaging ultraviolet rays when they are together.

Man, Dr. Montagu says, has no need to create a cooperative mood for himself by denying his savage strivings to be otherwise. The impulses toward cooperative behavior are already present at birth and need only to be cultivated.

"The infant of most vertebrates is equipped with the ability to compete with the universe for attention, and it generally succeeds in eliciting cooperative behavior, usually from one or both parents."

Dependency begins before birth, Dr. Montagu points out.

"The reproductive process is a cooperative one, and in addition development as one of a litter or group of siblings represents another early experience in the development of cooperation; development within a family represents a still further experience in the learning and practice of cooperation."

As the child matures, the socializing process continues and he becomes more and more dependent, more and more bound to others.

"Man does not want to be independent," Dr. Montagu says, "to be free in the sense of functioning independently of the interests of his fellows, freely and detached. This kind of negative independence leads to lonesomeness, isolation, and fear.

"What man wants is that positive freedom which follows the pattern of his life as an infant within the family, dependent security, the feeling that one is part of a group, accepted, wanted, loved and loving."

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FORESTRY

Find Rival Tannin Source In Mexican Seed-Pod

➤ THE seed-pod of the cascalote tree from nearby Mexico is a promising rival to the wood of the Argentine quebracho tree as a source of tannin for American leather, it was revealed by Armour Research Foundation of the Illinois Institute of Technology, which operates a research laboratory in Mexico City.

The Mexican product is also satisfactory for use in controlling the viscosity of the so-called muds used in drilling deep oil wells. Some 40% of the South American quebracho product imported to this country, is used for this purpose. Pumped down the hollow shaft that carries the rotating drill, these muds lubricate the drill, and bring the cuttings to the surface through the space surrounding the drill shaft. Proper viscosity is essential, and to secure it an additive to the usual clay-water mixture is needed.

Cascalote has long been used in Mexico in a crude form for leather tanning. The new development is a process that yields a stable concentrated extract of tannin suitable for export. The cascalote tree is plentiful in certain sections of Mexico, and only the seed-pod is used to obtain the tannin. Quebracho trees in South America are becoming less plentiful because the tree must be cut down to obtain its extract.

The United States imports of quebracho in recent years have been about 100,000 tons annually at a cost of about $40,000,000 a year, according to Dr. Francis Godwin of the Foundation's staff. About 90% has come from Argentina, whose price control policies and recent Anglo-Argentine trade pact discussions have tended to make U. S.-Argentine trade more difficult.

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AERONAUTICS-ENGINEERING

Non-Skid Brake Device Will Aid Plane Landings

➤ A NON-SKID brake device which will let planes land in a shorter space with greater safety has been announced by the Boeing Airplane Company in Seattle.

An automatic electronic valve system reduces the braking power when the speed of the wheels drops to almost the skidding point. By preventing skidding, the system brings the plane to a stop sooner. Added advantage claimed is a saving in tire wear.

Tests on the new system were made with truck-trailer, towed along plane runways at high speeds.

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ANTI-SKID-DEVICE—The centers of all four main wheels of the Stratofreighter are equipped with this automatic device which sets braking action to prevent skids from any cause. It weighs only three and one-half pounds.

MEDICINE

Blood Casts Aid Injured

➤ CASTS made of solid blood can repair severed nerve ends. The new blood casts were described to the Fourth International Congress on Otolaryngology in London by Dr. J. A. Sullivan of Toronto.

The casts are used on patients who have suffered wounds that cut their facial nerves or who have had tumors removed from a nerve.

The nerve stumps are sewn end to end, with fine sutures, or stitches. Then the sutured ends are placed in a flexible mold and some of the patient's own liquid plasma is poured in. The blood solidifies in three to seven minutes, after which the mold is removed, leaving the severed nerve ends encased in a cast of solid plasma.

Dr. Sullivan reported that this method knits the nerve ends together most effectively.

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BOTANY

English Grow Poison Ivy

➤ THE English, it is generally admitted, are quite hardy. As gardeners, some of them would seem even foolhardy. For they grow poison ivy as an ornamental vine!

Not long ago, an American botanist, leafing through a prewar nurseryman's catalog from England, came upon this astonishing entry:

"*Rhus Toxicodendron* Linn. The American 'Poison Ivy', a loose, rambling shrub or climber; the sap contains an irritant poison. Although a wonderful piece of brilliant autumn colour it should not be planted where likely to be handled."

The startled botanist set off a chain of inquiry which wound up at the London headquarters of the Royal Horticultural Society. The response:

"As far as they are aware the plant is still permitted to be sold freely here. It is essentially grown by the plant connoisseur, who cultivates it as an ornamental for its beautiful autumn foliage.

"The attitude here is that while some people are sensitive to its toxin, by no means all people are. It has never shown any tendency to become a weed here and is not found growing wild. There have been cases of *Rhus toxicodendron* dermatitis (ivy poisoning), but it is so rare here that the diagnosis is often missed until someone with special knowledge of the plant points it out.

"The beautifully coloured autumn leaves have even been used by horticulturalists to set off displays of their fruit at horticultural shows."

The very first Englishman to encounter poison ivy and write about it took an equally cool view of the plant. He was none other than the redoubtable Capt. John Smith, who met up with poison ivy during the early days of the Virginia colonization. For a man with his reputation as a first-class freehand exaggerator, Capt. John Smith gives an exceedingly conservative description:

"The poisonous weed, being in shape but little different from our English yvie; but being touched causeth reddness, itchinge, and lastly blysters, the which howsoever, after a while they passe away of themselves without further harme; yet because for the time they are somewhat painefull, and in aspect dangerous, it hath gotten itself an ill name, although questionlesse of noe very ill nature."

Yes, the English are a hardy race.

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VETERINARY MEDICINE

Quick Detection Possible For Chicken Tuberculosis

➤ A QUICK method for detecting tuberculosis in chickens was described by Drs. A. G. Karlson and W. H. Feldman of the Mayo Foundation and Dr. M. R. Zinober of the U. S. Bureau of Animal Industry to the American Veterinary Medical Association in Detroit. To a drop of the bird's blood a drop of a tuberculosis antigen is added. A cloudy precipitate indicates that the chicken is diseased; if the bird is healthy, the fluid remains clear. This test is more accurate than the older tuberculin test, the two researchers declared. It gave positive readings wherever the tuberculin test was positive, but also correctly indicated numbers of fowl to be tuberculous where the tuberculin test gave only negative results.

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ICHTHYOLOGY

Philippine Fish Killed by DDT Anti-Mosquito Spray

➤ YOUNG fish in shallow rearing ponds in the Philippines were killed in large numbers when the area was sprayed with DDT to control malaria mosquitoes, reports Dr. Earl S. Herald, curator of aquatic biology at the Steinhart Aquarium in Golden Gate Park.

The losses occurred in a big lot of young milkfish, a species of considerable economic importance in the Philippines. The owner of the ponds tried to reduce the damage by increasing the depth of the water; nevertheless he lost about half of his entire stock. Because of his protests, no further spraying was done over his ponds.

Dr. Herald also notes that another Philippine fish known as snakehead or mudfish are often killed by anti-malarial DDT spraying. Some Filipinos capture and eat such poisoned fish, but thus far none of them has been reported as suffering any ill consequences.

As a matter of fact, human beings seem to be tougher than snakes in this respect, for numbers of water-dwelling serpents have been killed by eating DDT'd fish.

Dr. Herald made his studies while serving as a member of the Army Air Force Committee on Aerial Dispersal of Insecticides.

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AERONAUTICS

Large-Size Flying Boats Superior to Landplanes

➤ THE flying boat is superior to the landplane in large sizes, the Anglo-American joint aeronautical conference was told in New York by D. Keith-Lucas of Short Brothers and Harland, Ltd., England. The large flying-boat is superior in the three things that pertain to the overall efficiency of an air line: economics, safety and reliability, he stated.

The landplane is the more efficient only in the smaller sizes, he continued, and only if by efficiency is meant its aerodynamic and structural efficiency as a flying machine. The greater the size, the greater is the advantage of the flying boat, until, on economic grounds, particularly in connection with provision of airports, it becomes impossible for the landplane to compete.

He compared a flying boat and a landplane dynamically similar, powered by the same engine, having the same range and able to carry the same weight of pay load. The flying boat is lighter than the landplane at weights greater than 100,000 pounds, he said, and faster at extremely high weights. But the landplane and the flying boat will have the same speed if they are large enough; this point of equal speed occurs somewhere between 250,000 and 500,000 pounds gross weight.

For practical purposes, the difference in performance between the flying boat and the landplane is extremely small at weights greater than about 250,000 pounds. The availability of bases and the distance to alternate landing places overshadow the flying efficiency. Future safety requirements will demand longer runways and alternate airports for landplanes, he declared, which can be provided only at an enormous capital expenditure that even military necessity might not justify.

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ASTRONOMY

Find New Sky Object

A minor planet or asteroid, which comes closer to the sun than any previously discovered, has been spotted at the new observatory at Mount Palomar.

➤ THE first great sky discovery made by the new observatory on Mount Palomar may help astronomers unravel the mystery of the origin of the solar system.

Baade's object, a minor planet, or asteroid, discovered late last month by Dr. Walter Baade with the 48-inch Schmidt telescope at Palomar, may continue to be observed as it follows its unique path around the sun, latest computations indicate.

The new asteroid comes closer to the sun than any previously discovered, approaching within 22,000,000 miles. Thus, its elongated, football-shaped orbit, or path, takes it within the orbit of the planet Mercury at its nearest approach to the sun, and out beyond the orbit of Mars at its greatest distance, 156,000,000 miles from the sun.

Believed to be only about nine-tenths of a mile in diameter, the new baby planet is now estimated to take only 343 days to complete one journey around the sun.

Drs. Robert S. Richardson and Seth B. Nicholson of the Palomar and Mount Wilson Observatories base their figures on five observations which have been made since Dr. Baade first found the new asteroid on photographic plates made June 26.

If astronomers can continue to keep track of it, the new discovery may give important data for studies of the solar system. Because of its path, it is expected to help astronomers determine the mass of the planet Mercury, which is still relatively uncertain.

The wide-eyed, 48-inch Schmidt telescope with which the new minor planet was discovered is the largest of its kind, though smaller than the more famous 200-inch 'scope on Palomar Mountain.

Too faint to be seen by the naked eye, the new asteroid is near the bright star, Antares.

At its closest approach to the sun, the new find is estimated to have a temperature as high as 1,000 degrees Fahrenheit, although the surface temperature is probably lower. But at its greatest distance from the sun, six months later, its surface is well below the freezing point of water.

It comes even closer to the earth than it does to the sun, 4,000,000 miles at its nearest approach. But this is much farther from the earth than an asteroid called Hermes, which once came within 485,000 miles of the earth.

Hermes disappeared, however, and was not observed again, so the new minor planet may be the closest one to us which astronomers can keep track of in its flight. If it is, Dr. Baade will get credit for discovery of both the closest and most distant asteroids to the earth which scientists have been able to compute orbits for. The Palomar astronomer, just 25 years ago in 1924, also discovered the minor planet, Hidalgo, most distant asteroid on record, which gets out to 900,000,000 miles from the sun.

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GENERAL SCIENCE

UNESCO Meeting Studies Work of Science Clubs

➤ CREATING and encouraging interest in science through club work was discussed at an international meeting of science club leaders held in Paris by the United Nations Educational, Scientific and Cultural Organization.

Watson Davis, director of Science Service, Washington, D. C., attended the meeting at which the work of Science Clubs of America, administered by Science Service, was studied.

Mr. Davis told the club leaders that Science Clubs of America now has 15,000 affiliated clubs in the United States and other countries, with a third of a million boys and girls participating in the program. In addition to the year-round club activity, Science Clubs of America also conducts the annual Science Talent Search for the Westinghouse Science Scholarships.

Dr. Pierre Auger, director of the department of natural sciences of UNESCO, was chairman of the international meeting.

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PLANT PHYSIOLOGY

Micrograft Method Saves Weak Hybrid Plants

➤ MICROGRAFTING, an exceedingly delicate technique in plant surgery, is being used by Dr. A. F. Blakeslee of Smith College, Northampton, Mass., to save weak but valuable hybrid plants, useful in the broad program of research into the cause of cancer.

The tiny plants, so weak that they are not even able to break through the seed-coat and sprout in the normal manner, are carefully removed from the seeds and nourished for a time in test-tubes on special food mixtures. When they are about an eighth of an inch long they are grafted into the stems of vigorous plants related to them.

Each graft is covered with a "micro-greenhouse" consisting of a gelatine capsule, which has been coated with nail polish to keep it from softening when wet. This protects the seedling against drying until the graft "takes."

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SAVING WEAK PLANTS—Hybrid plants too weak to survive under their own power are grafted into the stems of related vigorous plants. Micrografting, as this delicate plant surgery is called, is the work of Dr. A. F. Blakeslee of Smith College, shown here.

ENTOMOLOGY

Red, White and Blue Eyes Help Trace Bees' Flight

➤ RED-, white- and blue-eyed bees are being bred at the California Agricultural Experiment Station in Davis, Calif. by artificial insemination methods. This is not a patriotic stunt, nor do the unusual eye colors have any particular value in themselves.

They are being used by Dr. H. H. Laidlaw as natural markers. Bees with qualities which he wishes to study, such as efficient flight patterns and long working lives, are having these colored eyes bred into their strains, so that they may be easily observed at work. Hitherto it has been necessary to mark individual bees with tiny spots of paint—a laborious and somewhat touchy job.

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ZOOLOGY

"Extinct" Elephant Seals Stage Comeback off Mexico

➤ ELEPHANT seals, once thought extinct, are staging a rapid comeback in Mexican offshore waters, and may some day reoccupy their old-time range off the southern California coast, states Dr. George A. Bartholomew of the University of California at Los Angeles.

Elephant seals are huge animals, as much as 20 feet long and attaining several tons in weight. They get their name from the peculiar proboscis-like snout.

In former times they were hunted for their oil, which is much like whale-oil. During the nineteenth century the hunt was pushed so hard that it was thought the species had become extinct.

However, a small number of survivors were discovered on the Guadalupe Islands off the coast of Lower California. This area was made a permanently closed sanctuary by the Mexican government. They have now multiplied to such an extent that a few have appeared on the Coronados islands off San Diego, and on the Channel islands farther northwest.

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GEOLOGY

Backward-Flowing River Forms Delta at Wrong End

➤ THE fabulous horse with its head where its tail ought to be has a counterpart in a short river in the State of Maine, which has a delta at its head instead of at its mouth. This curious phenomenon is described in the journal, SCIENCE (July 15), by Dr. C. N. Savage of Kent State University, Kent, O.

The stream, known as Dead River, normally drains water from Androscoggin Lake into the Androscoggin River. Its course, mainly northwesterly, is six or seven miles long. It is very sluggish, since the usual difference in level between lake and river is only four or five feet.

However, during the time of spring freshets, the high-water level in the Androscoggin River becomes higher than the lake, and the current in the Dead River is reversed, so that it "flows backward" into the lake. At such times, the river water is heavy with rock silt, and this burden, dropped when the current of the Dead River enters the still water of the lake, is forming the delta.

The delta is now about one and one-half miles long and a quarter of a mile wide.

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PALEONTOLOGY

Insects in Baltic Amber Held Older Than Estimated

➤ ANTS and other insects embalmed in Baltic-region amber may have their ages revised upward quite radically. Hitherto they have been considered to be of Lower Oligocene date, some 8,000,000 or 9,000,000 years old.

Now, however, at least two outstanding scientists hold them to belong to the much earlier Lower Eocene, near the beginning of the Age of Mammals, and a good 55,000,000 or 60,000,000 years old. This new dating is agreed on by Dr. Frank M. Carpenter, Harvard University entomologist, and Dr. J. P. Marble, geologist of the U. S. National Museum.

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GENERAL SCIENCE

Science Teachers Urge Foundation Bill Passage

➤ THE Board of Directors of the National Science Teachers Association has urged passage of a bill to create a national science foundation.

A resolution adopted by the board supported the bill introduced by Rep. J. Percy Priest, D., Tenn., which is now before the Rules Committee of the House of Representatives. A similar measure passed the Senate in March.

Other resolutions adopted by the group:

Condemned "all efforts to stop medical research, including the essential use of experimental animals."

Urged that science be made a part of the "core" curriculum in schools, with a science sequence of courses in the secondary schools based on full elementary school science programs.

Asked the Association to continue its studies of new and existing equipment and supplies and new techniques for science teaching.

Called for reemphasis of the "necessity for freedom of scientific research and for freedom of interchange of scientific thought."

Science News Letter, July 30, 1949

IN SCIEN

CHEMISTRY

Traces of Toxic Gases Found in Cigarette Smoke

➤ TESTS made with a mechanical chain smoker have revealed that cigarette smoke contains the toxic gases, carbon monoxide and acetylene—but in amounts too small to be dangerous.

The machine smoked 10 packs of cigarettes every eight hours, and John B. Fishel and J. F. Haskins of the Ohio State University Research Foundation in Columbus, O., made a chemical study of the smoke. They did not compare different brands.

Their findings: in the 27 cubic inches of smoke given off by the average cigarette there is 3% carbon monoxide, 7.7% carbon dioxide and bare traces of acetylene and hydrogen sulfide.

The chemists have reported their work in the magazine, INDUSTRIAL AND ENGINEERING CHEMISTRY (July).

Science News Letter, July 30, 1949

GENETICS

Polish Biologist Straddles Soviet and Western Views

➤ BIOLOGY in iron-curtained Poland is apparently endeavoring to steer a middle course between the new "orthodoxy" of the Mitchurin-Lysenko school in Russia and the kind of life science considered valid in the rest of the world. In a recent publication, Prof. Stanislaw Skowron of the Jagellonian University, Krakow, has this to say:

"Today the science of heredity can supply direct proof of the evolutionary processes. The gene is no more regarded as an abstract entity but has become localized in the nucleus of a cell as a concrete functional unit. Modern genetics has also taken into account the influence of environment, as every trait of the organism is the result of cooperation of all genes with the environmental conditions."

All this agrees very closely with the position of geneticists and biologists generally in the West. Prof. Skowron, however, makes a bow towards the East:

"A new light has now been thrown on the controversial problems of heredity of acquired traits by the investigations of Russian scientists who have discovered new methods of dealing with this basic problem. One should expect that in the near future it will be possible to combine the principles of orthodox genetics with these new discoveries."

Science News Letter, July 30, 1949

E FIELDS

AERONAUTICS

Supersonic Air Jet Used in Airflow Studies

➤ A "WIND TUNNEL" that is not a tunnel is in use at the airplane division plant of the Curtiss-Wright Corporation, Columbus, O., for basic research in air flow phenomena. Its most important unit is a three-inch nozzle from which a 1,200-mile gale can be delivered.

Another unit is a calibration stand to measure the velocity of the air coming from the nozzle. Models of planes and missiles are attached to this stand and data relative to the effects of the air passing over them are obtained. The investigations made with this setup are similar to those made elsewhere with enclosed wind tunnels.

To obtain the highest speed of the supersonic jet, air is forced through the nozzle at 6,500 cubic feet a minute. The resulting blast will knock a man over if he gets in its path. Shock waves created by the terrific force of the air are clearly visible when the jet is operating, Curtiss-Wright officials state.

Science News Letter, July 30, 1949

RADIO

Wider Use of Television In Movies Foreseen

➤ WIDER use of theater television service is foreseen and the Federal Communications Commission has recently sent a letter to several organizations interested, inviting suggestions relative to the minimum frequency required, specific frequency bands desirable, and other information for use in issuing authorizations.

The Commission first opened the door for experimentation with radio relays for the development of theater television in 1945 in a general allocation hearing conducted near the end of the war. The Commission made available on a shared basis with other services the 475 to 920 megacycle band, as well as certain frequency bands in the 1,000 to 13,000 megacycle portion of the radio spectrum, and the bands 16,000 to 18,000 and 26,000 to 30,000 megacycles.

The first authorizations issued by the Commission for experimentation with radio relays for theater television purposes were granted on Nov. 18, 1947, to what is now Paramount Television Productions, Inc. This permission authorized on a temporary basis experimentation on frequency bands in the 2,000 to 7,000 megacycle regions in the area of New York City. Authorization was granted to Twentieth Century-Fox Film Corporation late in 1948 for experimentation in the 2,000, the 7,000 and the 13,000 megacycle regions.

Two methods of television programs inside motion picture theaters are in use. In one the television program is projected directly to the theater screen. In the other, the television pictures are photographed on regular 35-millimeter film, and this film is used to throw pictures on the screen with the use of the regular motion picture projector.

Science News Letter, July 30, 1949

ARCHAEOLOGY

Indian Relics from D. C. Given to Smithsonian

➤ LONG before Washington was built on the banks of the Potomac, an Indian town of some 300 families occupied part of what is now the District of Columbia. Capt. John Smith visited this settlement in 1608, but subsequent history shows little of this particular tribe. The red men seem to have just faded away before the oncoming of the whites.

A large collection of arrowheads and other things used by inhabitants of this lost Indian town has just been presented to the Smithsonian Institution by Georgetown University. The artifacts were collected about 50 years ago by Dr. Louis A. Kengla, who picked most of them up in open fields that are now covered by city blocks.

Good stone for arrow-head purposes seems to have been lacking, the collection indicates. Local materials consisted mainly of brown quartzite and white quartz, which are hard and difficult to flake properly. The lost tribe therefore imported a softer stone, known as rhyolite, from what is now Pennsylvania.

Science News Letter, July 30, 1949

AERONAUTICS

Flashing Lights Suggested For Private Planes

➤ FLASHING position lights for all night-flying private airplanes, similar to those now required on transports, were recommended by the U. S. Civil Aeronautics Administration, but no immediate steps are proposed to make their installation compulsory.

Inexpensive versions of the blinking lights are now available, costing from $4 to $20, and weighing from three to 20 ounces. They require very little electric power. Transport planes long have used flashing position lights because they are distinctive in the air. Steady lights can easily be mistaken for stars, CAA officials state. With lights flashing from 72 to 120 times a minute, there is little possibility of such a mistake.

Science News Letter, July 30, 1949

TOPOGRAPHY

Aerial Photos Aid in Making Navigational Charts

See Front Cover

➤ ACCURATE maps for basic defense and for charts used in navigation are now being made by the U. S. Coast and Geodetic Survey from aerial photographs made from a U. S. Coast Guard airplane, as shown on this week's cover of the SCIENCE NEWS LETTER. The Coast Guard airplane, with special photographing equipment, is devoting some nine months each year to this work.

The plane used is a converted B-17, Flying Fortress of World War II fame. The camera is clamped to a special permanent mount installed in the plane. It is a nine-lens camera, said to be the only one of its kind in the world. The photographs are taken at a height of approximately 13,750 feet. Each photograph is 35 inches square and records a ground area of about 120 square miles.

The plane requires a crew of eight. The photographs are taken by two representatives of the Coast and Geodetic Survey. Included in areas to be covered are parts of Alaska and the Aleutian islands. Work in these areas must be done in a few weeks in summer because photos of snow-covered terrain are worthless in map-making.

Science News Letter, July 30, 1949

ICHTHYOLOGY

Anchovies and Death Found In South American Lake

➤ FOOD and death both lurk for humans in the strange waters of Venezuela's Lake Maracaibo, a scientist at the Smithsonian Institution reported.

Dr. Leonard P. Schultz, curator of fishes at the institution, studied the fish life in the lake which has both fresh and salt water. Northern end of Lake Maracaibo meets the Caribbean Sea, while the southern portion is fed by fresh-water rivers.

Anchovies, a herring-like fish best known from European waters, are in the lake in great quantities, Dr. Schultz found, apparently unexploited and virtually unknown to fishermen.

Worst menace of the lake's water is not the fairly large sharks found there but a relative of the sharks, large sting rays.

Sting rays are flat and plate-shaped, with a long, sharp spine sticking out of the tail. The tail is so powerful that the spine of even a small ray can be driven completely through a person's foot. The spine is probably poisonous.

When wading in tropical waters, push your feet along the bottom instead of taking steps, Dr. Schultz advises. This way you won't step on a ray.

Science News Letter, July 30, 1949

ICHTHYOLOGY

Electronic Fish-Finder

This instrument spots for fishermen the location of fish, indicates about how many there are, their speed and direction of travel, and often their species.

By DON EDDY

➤ IN THE summer of 1947 the crews of 14 commercial seining boats out of southern California ports witnessed a demonstration of fishing magic. For days they had patrolled the fringes of an enormous bed of kelp near Cedros Island off the Mexican coast, waiting for schools of tuna to leave the kelp and return to the open sea. Until that happened they dared not set their nets, for kelp is a heavy, matted seaweed which forms writhing masses that can snarl and sink any seine.

Into this stalemate steamed another seiner—the Caesar Augusto commanded by Capt. Larry Zaunich. Customarily, Capt. Zaunich would have joined the waiting fleet; instead, he nosed his prow into the kelp bed. Before dark that day he was safely out with his nets intact—and 150,000 pounds of fresh tuna in his hold. In port, his bewildered colleagues bombarded him with one question: How did he do it?

"Easy!" grinned Capt. Zaunich. "I used a gadget that found holes in the kelp bed big enough for my seine, and even told me whether there were fish in the holes."

Finds Fish Unerringly

Then a curiosity, the gadget was a Bendix DR (Depth Recorder)—an electronic device which started as a navigational aid but has recently become the most exciting news in the commercial fishing industry. Enabling fishermen to "see" vast distances under water, it finds fish unerringly in sunshine, storm, fog, or darkest night.

The Bendix DR shows fishermen instantly and accurately where fish are, approximately how many there are, how fast and in what direction they are traveling, and in many cases what species.

Although only 2500 of the nation's 83,000 commercial fishing craft are equipped with fish-finders, the total catch of fish last year was 125,000,000 pounds greater than in 1946, when only a few finders were in use.

To watch the fish-finder at work, I stood in the wheelhouse of a 150-foot purse seiner off the Carolina Capes while Capt. Roy Goodwin tracked down menhaden, one of the most valuable of America's commercial fishes. Mounted on the bulkhead in front of the ship's helm was a box about the size of a portable radio. A scroll of paper moved slowly across the face of the box. The paper was lined vertically, representing the undersea area forward and beneath the ship; numbered lines ran horizontally, indicating the depth. Thus the graph was in effect a map of the water for hundreds of feet, divided into sections each representing one minute's travel time of the vessel.

Across the face of the graph horizontally as the ship cruised along, styli were drawing two roughly parallel lines. The top line represented the surface of the ocean; the bottom one showed the jagged, irregular outline of the ocean floor below us. Between the top and bottom lines the styli were also drawing scores of odd-shaped doodles, sometimes singly but often in clusters. "Those are fish," said Capt. Goodwin, "singles and little schools." He watched the device until a big black doodle formed at a depth of about 40 feet and some 100 feet ahead. Ringing for reduced speed, he said, "That's a school of menhaden."

Schools of fish used to be spotted by lookouts until the advent of the fish-finder. Although the lookouts could not see far below the surface, especially in bad weather, Capt. Goodwin clung to tradition by keeping three men in a crow's nest atop the mainmast. They had seen no fish and now reported they still could see none, although the huge school was clearly visible on the fish-finder's graph.

Maneuvering his boat to keep the fish just ahead without getting close enough to alarm them, Capt. Goodwin ordered the longboats away with the seine. By comparing the location of the fish with the longboats' position, he directed the men in them until the school was surrounded, the seine lowered and the purse-line drawn to close it at the bottom. Soon we watched 90,000 shimmering menhaden cascading into the hold, on their way to becoming vitamins, cosmetic oils, livestock feeds and fertilizers. "We'd have missed them entirely without this gadget," the captain said. On two successive weeks previously he had caught 200,000 and 300,000 fish which no one saw until they were netted. "I reckon I've caught a million more fish with the Bendix DR this year than I would have caught without it," Goodwin told me.

Many Fishermen Doing Well

Other menhaden fishermen with whom I talked had done about as well. The two largest schools ever reported were located with fish-finders last summer. Said Joseph C. Jett, of Reedville, Va., a fleet owner who has equipped all his ships: "It's like

MENHADEN FLEET—This fishing fleet at Beaufort, N. C., lets the fish-finder do the work of locating their catch.

SCIENTIFIC FISHING—Capt. Roy Goodwin, skipper of a menhaden boat, watches the smudges on the graph which indicate to him where a school of fish can be found.

being down there in a diving suit, only better because there's practically no limit to the DR's visibility."

The fish-finder operates by sound waves. It has long been known that sound travels through water at approximately 4800 feet per second. The practical use of this knowledge, of course, seemed to be in measuring the depth of water, but little was done about it until, in 1912, the Titanic rammed an unseen iceberg and sank with a loss of 1517 lives.

Underwater Echoes

Spurred by world-wide clamor for a device which would detect invisible navigational hazards, scientists in Europe and America hurriedly began to experiment with underwater echoes.

In the United States, Prof. R. A. Fessenden developed a powerful oscillator to provide sound of great intensity in water and an instrument to convert the travel time of sound into measurement of distance. But sounds of audible pitch were too easily confused with such noises as breaking waves and churning propellers. Then, in France, scientists Langevin and Chilowsky developed an apparatus to project sounds of such high pitch that they were inaudible to the human ear but could be detected by special listening devices.

Now the path for development was clearly marked. In 1918 the United States Navy installed its first echo-sounder. By 1925 echo-sounders had become available to commercial vessels to detect shoals and obstructions. Today, they are used as navigational aids all over the world.

In operation, continuous streams of sounds are emitted from a device on the bottom of the boat. The sounds travel in a widening cone like shotgun pellets and send back echoes when they strike solid objects. Capturing the echoes, the apparatus instantly computes the time elapsed since the discharge of the sound, translates this time into lineal distance, and figures the object's size, shape, and relative density. In some instruments (two others besides the Bendix are made in the United States, one in England and one in Canada) part of this information is conveyed to the mariner by flashing lights or buzzes, but the Bendix DR transfers all of it to a graph where it appears as a pen-and-ink record.

From the earliest tests, experimenters were perplexed by mysterious interferences. Sometimes in deep water with no known obstruction within miles, the echoes bounced from objects which were fairly close to the ship, and apparently moving. Evidently these strange objects were fish, and it was only a step to the realization that if fish could be detected with sound waves, so could submarines. Echo devices in various forms (including radar, which employs the same principle in air) thus became major tools of modern warfare.

First Application to Fish

But through the early years, fish remained only a nuisance to echo-using mariners until a Norwegian, the late Dr. Oscar Sund, then biological research adviser and one of the leading scientists of the Norwegian Institute of Fisheries, realized that an echo device might be a means of finding more fish for a hungry world. In 1935 a research ship carrying the first echo-sounder ever installed for the purpose of finding fish set out for the Lofoten Fisheries off northern Norway. At the controls was Dr. Sund's aide, Dr. Gunnar Rollefsen, now director of the Institute and his country's delegate to the United Nations' subcommittee studying world fisheries.

Long before the fishing banks were reached, Dr. Rollefsen detected echoes bouncing from strange objects just above the floor of the sea. Although this had been presumed to be barren territory, Dr. Rollefsen said: "I believe they're fish, 70 to 80 fathoms deep." Fishermen lowered their lines to 75 fathoms—and immediately caught codfish! As the exploration continued, numerous new fishing banks were found and charted.

Oddly enough, owners of fishing boats were not excited by the Institute's report, even after a commercial boat out of Bergen paid off the cost of an echo-sounder with a single catch. Part of the apathy was due to the high cost of the apparatus and the low price of fish, but most of it was because of the fishermen's stubborn adherence to the ages-old methods of fishing.

Today this resistance has vanished and Norway leads the world in scientific fishing. Nearly all of its major herring boats and more than half of its ocean-going cod boats carry fish-finders. Immensely valuable new fishing grounds in that part of the world are being discovered; the annual catch of herring and cod has been increased by a third.

The Bendix DR grew out of World War II. Echo-sounders then in use were cumbersome and expensive. U. S. military planners during the war assigned a top-secret project to the Bendix Aviation Corporation —to create portable depth recorders which could be operated silently in total darkness in small rubber boats to discover mine fields along enemy shores and to chart enemy harbors in preparation for invasions.

Graph Method Devised

Since flashing lights and buzzing signals were out of the question, the graph method was worked out by electronic wizards, and Bendix DRs preceded invasion troops into countless beachheads. No whisper of their existence was permitted to reach the public, but in 1944, with the war at its height, the U. S. Navy considered the fish-finding potentialities of the device so important for increasing our food supply that a submarine chaser was assigned to aid the Federal Fish and Wildlife Service in tests off the Pacific Coast.

The sub-chaser explored waters where no fish were known to be—and found fish constantly. Aquatic biologist Osgood R. Smith, operating the equipment, once located 21 schools in 86 minutes. These data were released to fishermen toward the end of the war.

The first Bendix DR was installed on the commercial fishing boat Northern Light out of Fort Bragg, Calif., in 1946. It had formerly taken Capt. Ted Aaker four days to fill his hold with sole and rock cod, but with the magic fish-finder he took 3,000 pounds of these fish, a boat load, in two days on his first trip.

Capt. Lawrence Doving installed a fish-finder on his Optu and started through Hecate Strait north of Vancouver Island, B. C., bound for an area at sea where he had been catching dog fish for their livers. No one had suspected there were commercial fish in the Strait, but Capt. Doving was back home the next day with 20 tons of fish. His normal cruise would have been two days each way and eight days of fishing.

Capt. Lloyd Lindwall of Santa Barbara, Calif., ordinarily fished for sea bass, shark, albacore and swordfish off Santa Cruz Island, a half-day's run from his harbor. On his second trip with a Bendix DR he was midway to the island when he noticed doodles on the graph. He set his seine and caught a load of sharks whose livers were worth $10,000.

At Vancouver, B. C., a herring seiner turned the air blue when the fish-finding apparatus was not completed in time for him to sail with the rest of the fleet. Leaving port an hour late, he was chugging in the wake of the other vessels when the

Bendix engineer who was aboard as an observer picked up a dense concentration of fish just ahead. "It isn't possible," the skipper argued. "Every boat in the fleet has passed over them." But the Bendix man persuaded him to set his net—and he was back home in mid-afternoon with a hold full of herring.

Tuna fishermen cruising into South American waters out of San Diego, Calif., were plagued by a shortage of small bait fish, a variety of anchovy, which they throw into the water to attract tuna to the boat. The exasperated skipper of the tuna clipper American Girl installed a fish-finder on his auxiliary bait-scouting cruiser last season—and immediately found bait where none was supposed to be. The graph revealed that the little fish had become wise to the ways of nets and were simply diving under them. The skipper foiled this stratagem by using nets which scraped the bottom. Now that bait is no problem, he expects to add $300,000 to his ship's revenue and great quantities of tuna to the nation's food supply this year.

In Cuba tons of fish were discovered and caught in Havana harbor this spring by the first Cuban boat electronically equipped, although no fisherman had suspected they were there. So impressed was the Cuban government that special funds were appropriated to equip the nation's 60 major fishing vessels. Result: the average fishing cruise has been shortened from 25 to 15 days and the average catch has almost doubled.

Industry is adapting the fish-finder to all sorts of work. Four major oil companies exploring the Gulf of Mexico, and Lake Maracaibo in Venezuela, use Bendix DRs to detect slight variations on the bottom contour to determine the most advantageous drilling locations. At New Orleans a ship-builder uses one to chart the buildup of silt around docks. At San Diego, army engineers use several to maintain checks on the depth of ship channels.

Infinitely more important, military strategists point out that in the event of war, thousands of small craft electronically equipped could constitute a tight ring of never-closing eyes around our sea-coasts, for fish-finders can ferret out mine fields and submarines with the same sureness that radar warns us of the approach of surface vessels and aircraft.

Since DRs cost $890 to $2475, depending upon their size and the extent of the range they can "see," they are not yet practicable for the family rowboat, although they can be operated from ordinary automobile batteries. When smaller models are perfected they can be expected to eliminate even for sportsmen that imponderable called fisherman's luck.

Meantime, while there is a tremendous demand from sport fishing craft, Bendix is allocating almost all its output to commercial fishermen because they believe that this amazing device should be concentrated on providing more food for hungry humanity from the almost inexhaustible resources of the sea.

This article was prepared for the SCIENCE NEWS LETTER *in cooperation with* THE READER'S DIGEST *and will appear in the September issue of that magazine.*

Science News Letter, July 30, 1949

MEDICINE

Allergy-Drug Reactions

➤ EVIDENCE of serious reactions and even one death due to some widely used anti-allergy drugs is presented in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 23).

Death resulted in a 16-month-old girl who was poisoned by accidentally swallowing an adult dose of a compound with the trade name of Thenylene hydrochloride, according to Drs. Hugh F. Rives, Berl B. Ward, and M. L. Hicks of Dubuque, Iowa.

This drug, and the others which gave severe reactions, are antihistaminic compounds used to check the action of histamine, a poison released by body tissues in allergic reactions. There are many on the market widely used for such allergies as hay fever, hives, and skin inflammation caused by reaction to drugs. Some have even been used to treat colds.

Unfavorable reactions occur in from 25% to 65% of the patients treated with antihistaminics, the physicians stated. Reactions are in the form of drowsiness, vomiting, diarrhea, headaches, nervousness, fainting spells, severe prostration and mental upsets.

Irritation of the brain seems to be responsible for these reactions, the report indicates. The physicians add that there is no effective antidote for these drugs. If the patient exhibits toxic reaction to the drugs, their administration should be stopped immediately and the individual symptoms should receive treatment.

Science News Letter, July 30, 1949

AERONAUTICS

Photoflash Bulbs on Planes Present no Hazards

➤ PHOTOGRAPHIC flash bulbs in an airplane present practically no hazard, the Civil Aeronautics Board has found, and it sees no reason to require or ask special restrictions in their transportation.

"Although modern photographic flash bulbs have been fired remotely by high frequency radiant energy (radar) under ideal laboratory conditions," the Board states, "to date it has been impossible to fire one by this means under actual or simulated flight conditions in all-metal aircraft."

A tragic crash of an airliner following fire in the air in October, 1947, raised the question of whether or not photoflash bulbs could be flashed or exploded by radar energy from within or outside the plane. The question was also raised whether they could be flashed by impact, friction, radiant energy, elevated temperatures, electrostatic discharges, changing magnetic and electrical fields and the combustible effect on the standard package containers.

Even under extreme conditions met in air transportation, bulbs are not a hazard from these causes, the Board found. When modern but defective bulbs were flashed and exploded electrically in a combustible atmosphere of gasoline vapor, no ignition occurred. The possibility of firing them by impact and resultant friction is extremely remote, if the bulbs are packed in containers.

Science News Letter, July 30, 1949

ENTOMOLOGY

Insect Eggs Found on Outside of Airliner

➤ AIRPLANES may have to be DDT'd outside as well as inside, to prevent hitchhiking by insect pests. In the scientific magazine, NATURE, is a report of the discovery of a mass of moth eggs on the wing of an airliner from Brazil that landed at the British airport on Trinidad island.

The discovery was accidental. A customs officer who had leaned against the plane wing found a smudge on his uniform. Investigating, he found the egg mass, which was collected by a malaria control officer and identified as belonging to an insect group embracing several harmful species.

Science News Letter, July 30, 1949

AGRICULTURE

Hay Quality Not Bettered By Use of Fertilizer

➤ FERTILIZING land increases the quantity of a crop that can be grown on it but does not raise its quality, experiments at Michigan State College in East Lansing, Mich., indicate.

Two herds of dairy cows were fed on hay produced on poor soils. One herd received hay raised on untreated soil, the other got hay from soil that had been fertilized. No material differences could be found in either the nutritional condition of the animals themselves or in the quality of their milk, although a much larger area of unfertilized soil had to be mowed to provide enough hay for the cows it was called upon to support.

Science News Letter, July 30, 1949

MEDICINE

Sickle Cell Anemia Theory

➤ THE reason why some individuals develop the severe, disabling, chronic form of anemia known as sickle cell anemia is reported by Dr. James V. Neel, of the heredity clinic, laboratory of vertebrate biology, at the University of Michigan.

"If a drop of blood is collected from each member of a randomly assembled series of American Negroes," he writes to the scientific journal, SCIENCE (July 15), "and sealed under a cover slip with vaseline, to be observed at intervals up to 72 hours, in the case of about 8% of the individuals composing the series a high proportion of the erythrocytes (red blood cells) will be observed to assume various bizarre oat, sickle, or holly leaf shapes."

The majority of those who have this peculiarity of the blood cells do not have any disease at all, but a certain proportion have sickle cell anemia.

The reason why only some of those whose blood "sickles" suffer from sickle cell anemia is explained by a theory proposed by Dr. Neel. If a child has only one parent who sickles, then the child's blood may sickle, but he will not have sickle cell anemia. If, however, the child inherits the sickling trend from both parents, he will not only sickle, but will have sickle cell anemia.

To test this theory, Dr. Neel started to test the blood of the parents of patients with sickle cell anemia. So far he has tested parents for 29 patients. In 13 cases, both parents were tested, in 16 only one. Every parent so far tested has shown the sickling.

These findings suggest a way of wiping out the dread sickle cell anemia. If persons whose blood sickles should avoid marriage with one another, the disease, Dr. Neel says, would tend to disappear, with only a very rare case as a result of mutation in a normal individual married to a person with one or both parents who sickle.

Science News Letter, July 30, 1949

MEDICINE

Pain Has Work Origin

➤ IF YOU think your work is giving you a pain in the neck and arms, you may be quite right and not at all neurotic or rheumatic.

Work pressure, faulty working posture and nervous tension may cause occupational disorders with symptoms that can be confused with rheumatism and neurosis, Drs. Henrik Seyffarth and Kirsten Moinichen of Oslo, Norway, declared at the International Congress on Rheumatic Diseases in New York.

The diagnosis of neurosis is sometimes made, they explained, because the patient's pains vary with his state of mind. The physical condition causing muscle, joint and tendon pain may not show up in a perfunctory examination. And neurosis may be a factor. But "even then," the Norwegian doctors said, "the organic changes are due to overstrain and wear and tear of the skeletal muscles."

Pain in the neck and arms, known to doctors under the medical term, cervicobrachialgia, affected 63% of 222 women clerks of an Oslo insurance firm studied by the Norwegian doctors. Practically all these cases were occupational disorders, the doctors found.

Clear symptoms of occupation myositis, or muscle inflammation, characterized by fatigue pains during work, were found in 51.4% of the women. "This soreness is generally found in the muscles used in static work, particularly in those whose main duty is to maintain an unvaried position while working," Dr. Seyffarth said.

For treatment of these conditions, he recommended heat, massage, X-ray, and, sometimes, novocaine injections. For lasting results, however, rest and relaxing gymnastics, with proper costabdominal respiration and instructions in the correct way of using the muscles in work, were suggested.

Dr. Seyffarth said that prophylaxis should include inspection and correction of the employee's working site and manner of working, plus 10 minutes daily light exercise during office hours, preferably under the direction of a trained physiotherapist. In many offices where these forms of therapy and prophylaxis have been used, he said, "lost working time from cervicobrachialgia has been reduced from 25% to 2%."

Science News Letter, July 30, 1949

ENGINEERING

Clay Under Mexico City Hampers Construction

➤ A SPONGY clay that underlies Mexico City creates a special problem in heavy building construction, the American Society of Civil Engineers was told recently by Ing. Pedro Albin, Jr., engineer of La Latina Americana. The whole plateau on which the city is built is gradually settling, he said, but heavy structures may settle at a faster rate.

He cited as an example one structure built on piles to avoid settlement which appears to grow in height as the level of the surrounding street falls. He cited, also, the case of a concrete building which has settled in a five-year period so that the ground floor is now a foot below street level. For the past 30 years, he stated, long wooden piles, some 112 feet in length, have been driven under buildings to secure support from a deeper and stronger stratum.

To avoid settlement of a building now under construction, it is proposed to mount the ground-floor slab on screws so that it can be lowered as the surrounding streets settle. For the same building, a long type of concrete pile is being introduced from the United States. It has a precast concrete "button" on the end, which makes it adapted to foundation conditions similar to those encountered in Mexico City.

Science News Letter, July 30, 1949

GENERAL SCIENCE

Touch Museum Exhibits Are for the Sightless

➤ A TOUCH museum exhibition for the blind in London now has 60 science displays for sightless visitors.

The exhibit, believed to be the first of its kind in the world, is located at The Science Museum of South Kensington. Only the blind or persons accompanying a blind person are permitted to attend the exhibit.

Displays ranging from mathematical principles to modern transport are placed on tables about waist-high so that they can be conveniently touched. Each display has a label in braille and a longer description which can be read to blind visitors by their escorts.

Science News Letter, July 30, 1949

ENGINEERING-AERONAUTICS

Helicopter Propellers To Be Tested on Giant Motor

➤ A GIANT electric motor will soon be in use at the Wright-Patterson Air Force Base, Dayton, O., in a program for the development of propellers for bigger and better helicopters. It was built for the Air Force by Westinghouse Electric Corporation, weighs 48 tons and is rated at 4,000 horsepower.

The motor is to be installed on a steel tower 30 feet from the ground where it will be able to spin high over the disturbances caused by ground-level air currents. It is not intended for airborne use, but is merely to provide test facilities for the necessary propeller experiments.

If actually used in a helicopter, it could lift craft weighing 50,000 pounds. This is about five times the weight of the largest helicopters now in use. Present aircraft of this type use motors ranging from 65 to 550 horsepower, with propellers up to 48 feet in diameter.

Science News Letter, July 30, 1949

BOTANY

NATURE RAMBLINGS by Frank Thone

Season of Sneezes

➤ THE ragweeds, low and tall, will begin shedding pollen in the northern states in a few days, and will continue to keep sensitive noses and eyes miserable until well into September. In the South, ragweed pollen seasons begin later, about mid-August or even the first of September, but last into October. Southernmost ragweed patches, far down in Texas and Florida, however, seem able to pour their irritating dust into the breezes from early July until late October, or even longer.

Ragweeds figure most importantly as hay-fever causes in this country. Although pollens from some dozens of other plant species do provoke this most distressing type of allergy in some persons, at least nine-tenths of all cases are primarily due to the pollens of these two weeds.

Although they are botanical first cousins, low ragweed and tall ragweed do not look very much alike. Low ragweed is usually about knee-high to a tall man, seldom more than waist-high. Its leaves finger out into many fine subdivisions. Tall ragweed ranges normally from head-high to more than twice that, and its big, coarse leaves are three-lobed—like mittens with two thumbs instead of one.

In classifying plants, however, botanists go by the flowering structures; and in these the two weeds are very much alike. The pollen-shedding or male flowers (which are the business end of the weed, so far as hay-fever causation is concerned) are borne in long spikes at the top of the plant.

Many communities now attack their ragweed patches early in the season with 2,4-D or other chemical weedicides, instead of laboriously scything them down, as formerly. Even if this precaution has been neglected in your neighborhood, however, and the ragweeds are ready to shed their pollen, much of the mischief can still be prevented if action is taken promptly. A good spraying now may not kill the troublesome growths outright, but it will largely abort the flowers and prevent the shedding of the pollen.

Science News Letter, July 30, 1949

GENERAL SCIENCE

Attack AEC Clearance

➤ A PROPOSAL to require Federal Bureau of Investigation clearance for all holders and applicants for Atomic Energy Commission fellowships is under attack from some scientists.

Sen. Joseph C. O'Mahoney, D., Wyo., is offering an amendment to the Independent Offices appropriation bill, which carries AEC funds, calling for the blanket FBI investigation of AEC fellows.

AEC fellowship holders are now required to sign a loyalty oath and non-Communist affidavit. This was inaugurated in May after the discovery that a University of North Carolina student receiving AEC funds was an admitted Communist.

Any of the AEC fellows doing secret work or using secret information are investigated by the FBI, but many of the students aided by the fellowships have no contact with such material.

When the issue of an FBI clearance for all AEC fellows came up in May, Sen. O'Mahoney and others supported it. But vigorous objection was voiced by leading scientists, including several who approved the oath and affidavit adopted by the Commission.

Among the scientists who have publicly opposed extending the FBI investigation to fellowship holders doing non-secret work are: Dr. Detlev W. Bronk, president of Johns Hopkins University and chairman of the National Research Council which administers the AEC fellowship program; Dr. J. Robert Oppenheimer, director of the Institute for Advanced Study, Princeton, N. J.; Dr. Alan Gregg, director of medical sciences for the Rockefeller Foundation; Dr. Lee A. Dubridge, president of the California Institute of Technology; and Dr. Enrico Fermi, Institute for Nuclear Studies, University of Chicago.

Chief points made by these scientists and others are that the FBI investigation is unnecessary where no secrets are involved and that such investigations would be against the traditions of both science and the nation.

In support of the investigation, Sen. O'Mahoney has explained that he wants to make sure no atom fellowships go to Communists.

Latest attack on the proposal is a letter signed by representatives of several scientific, educational, religious and political groups urging that the amendment be withdrawn.

The letter just made public attacks the investigation as being "at variance with our democratic tradition and procedures." It urges more public discussion of the issue before it is decided.

Science News Letter, July 30, 1949

ORNITHOLOGY

Ducks Forced Northward By Drought Conditions

➤ DUCKS have been having their drought troubles, too, this summer, states F. C. Lincoln of the U. S. Fish and Wildlife Service. Flocks flying north last spring found their usual nesting sites in the southern parts of Canada's prairie provinces and the north-central states of this country badly dried up. So they had to keep on going until they found adequately wet habitats in the "bush" country of Canada, and even on up into the margins of the tundra. That is where they are now; but it is definitely second-rate housing so far as ducks are concerned.

At that, though, the situation might have been worse, Mr. Lincoln adds, philosophically. If there had been enough water on the usual duck range to induce them to nest, and if drought had come after their families had been started, the mortality among the new generation of ducklings would have been extremely high. As it is, the ducklings are getting at least some kind of a break, although they are more exposed to attacks from their enemies than they normally are on the southern parts of their range.

Despite this unfavorable situation, there will be a good increase in the duck population this year. Only, it would have been very much larger had breeding conditions been more nearly normal.

In the meantime, rains have fallen over much of the normal duck country—but there are no ducks there to enjoy the renewed wetness. However, the water-plants on which ducks like to feed are growing apace now, so that when the autumn flights start southward there should be plenty of food waiting for the migrants.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

THE ADRENAL CORTEX—R. Gaunt and others—*New York Academy of Sciences*, 170 p., illus., paper, $3.00. This monograph is concerned largely with new and specialized aspects of the subject.

ANALYTIC GEOMETRY—John J. Corliss, Irwin K. Feinstein, and Howard S. Levin—*Harper*, 370 p., $3.25. A text for the student of mathematics or engineering.

ANTIBIOTICS DERIVED FROM *Bacillus Polymyxa*—P. H. Long and others—*New York Academy of Sciences*, 160 p., illus., paper, $2.25. Historical aspects of *Bacillus Polymyxa*—its discovery and development.

ATOMIC ENERGY YEARBOOK—John Tutin, Ed.—*Prentice-Hall*, 237 p., illus., $3.85. A history, a contemporary account, and a prediction of things to come. Contains not only the technical data on atomic energy but also the social effects upon us.

CALCULUS—Lyman M. Kells—*Prentice-Hall*, 2nd ed., 508 p., illus., $5.35. An introductory text.

THE CHINA THAT IS TO BE—Kenneth Scott Latourette—*Oregon State System of Higher Education*, 56 p., paper, 75 cents. A short history of the China that has been, the China that is, and the China that is to be.

CONSTRUCTIVE USES OF ATOMIC ENERGY—S. C. Rothmann, Ed.—*Harper*, 258 p., illus., $3.00. Describes the uses to which the "Peaceful Atom" has already been put and its potentialities. Written from the point of view of intelligent laymen by leaders in atomic research.

DISPOSAL OF SOUTHERN WAR PLANTS—Frederick L. Deming and Weldon A. Stein—*National Planning Association*, 74 p., illus., paper, 50 cents. Deals with the disposal of federally-financed manufacturing and how it has been adapted to peacetime needs. Data prepared by NPA Committee of the South.

POLIO CAN BE CONQUERED—Alton L. Blakeslee—*Public Affairs Committee*, 31 p., illus., paper, 20 cents. Information for the layman and tips for parents.

SELECTED PUBLICATIONS AND MATERIALS RELATING TO AMERICAN FOREIGN POLICY—*Division of Publications, Department of State*, 22 p., paper, free upon request to publisher, Washington 25, D. C. A bibliography of all publications still available with the exception of those which are of purely historical interest.

U.S.A. MEASURE OF A NATION: A Graphic Presentation of America's Needs and Resources—Thomas R. Carskadon and Rudolph Modley—*Macmillan*, 101 p. illus., paper, $1.00 Presenting in pictorical graphs statistics on American economy since 1850 and indicating expected developments to 1960.

THE WORD BANK—Sophie Basescu—*Rodale*, 189 p., $3.00. Will help writers to find just the right word or to produce variety. Divided into sections of related words.

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MEDICINE

Range of Vision Enlarged

➤ A LOOK in time saves embarrassment, especially in patients who are blind in one eye and cannot see persons or objects approaching them from their blind side. To help them, a mirror attachment for their glasses has been devised by Dr. Eric Bell, Jr., and associates at the Cleveland Clinic and the Frank E. Bunts Educational Institute in Cleveland.

The mirror has a convex surface and is attached at right angles to the plane of the lens of the glasses at the bridge of the nose. In this way the patient glimpses movement on his blind side and turns his eyes that way, Dr. Bell explained in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 23).

These patients were afflicted with hemianopsia, which is a partial or total paralysis of some of the optic nerve fibers, restricting part of the field of vision. They complained that they underwent constant danger and embarrassment because they failed to see moving cars, collided with other pedestrians when looking in shop windows and failed to see food passed to them at the dinner table, Dr. Bell said.

The gadget added to the glasses, Dr. Bell declared, helped to increase the field of vision in these patients. In a few weeks they were able to interpret what they glimpsed in the mirror and because of its position there was the added advantage that the farther they turned their eyes to the unaffected side, the wider and clearer was the reflection seen in the affected eye.

Dr. Bell believes that this device may be adapted to other visual defects that limit the range of vision.

Science News Letter, July 30, 1949

ECOLOGY

Snakes, Rats and Birds Thrive on A-Bomb Site

➤ WORLD'S first atomic bomb blast, at the Trinity site near Los Alamos, N. Mex., four years ago July 16, apparently has had no ill effect on succeeding generations of animals and the desert vegetation is recapturing the area of the burst's crater.

But scientists are still looking for any possible after effects which might remain in living things in the area, Atomic Energy Commission officials said.

University of California scientists, under contract to the Commission, this summer are continuing a survey of crater area and "fall-out" region. The fall-out refers to the bits of radioactive material from the blast which gradually settled out of the atmosphere after the explosion.

Mice, rats, rabbits, snakes, lizards and birds in the region have been studied, but they all appeared to be normal and in good health.

Weeds and grasses have appeared where the bomb was exploded, and scientists predict that the crater area will in due time become reestablished with the typical desert vegetation.

Most important scientific studies relating to the blast effects on life are now being carried on at the University of Tennessee in Knoxville, where a herd of range cattle accidentally exposed to fall-out are now under study. This study will go into several generations and require several more years, but thus far no ill effects from radiation exposure have been reported.

Science News Letter, July 30, 1949

Words in Science—PSYCHOSIS-NEUROSIS

➤ MEDICAL name for the serious mental diseases is psychosis, pronounced sigh-koe-sis (plural psychoses). A person affected by a psychosis is, in some respects at least, out of touch with the world of reality. He often does not realize that he is ill.

A neurosis, pronounced new-roe-sis, is a much milder form of mental disorder that is often popularly called "nervous break-down." The sufferer usually knows very well that he is ill, and continually seeks medical aid to cure him. The neurotic person may be in the grip of abnormal fear, worry, or may feel compelled to repeat certain gestures or acts that have no meaning in terms of the immediate situation, but ordinarily he sees the world around him just about the same as his neighbors do.

Science News Letter, July 30, 1949

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 476. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

SUN-TAN METER, which does not measure the tan on the human body but determines the degree of tanning energy in either sunlight or from artificial lamps, consists of filters, light-sensitive cells and a recording device. The cells under ultra-violet tanning radiation become sources of electricity which activate the meter.

Science News Letter, July 30, 1949

FLUSHING RACK for baby diapers is a simple chrome-plated flexible wire bracket that snaps into the forward part of the modern flush toilet. Two spring holders on it grasp the diaper by a clean corner; flushing the toilet once or twice does the rest of the job.

Science News Letter, July 30, 1949

SCUFF PLATES, for office swivel chairs of the revolving type, are made of a tough resilient plastic and are attached with cement to the bases to protect them from shoe-heel scratching. They are chip-proof, naturally lustrous, have long life and are easily cleaned.

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OILER for home or office, shown in the picture, is fountain-pen size with a transparent plastic container so that the level of the oil is always visible. In use, a steel tip on the oiler is depressed on the part to

be lubricated and then released. Each time this is done, a little oil is ejected.

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WINDOW GUARD of four nickel-plated steel bars eliminates any possibility of a youngster's tumbling out. The easily attached guard, which requires no tools to install, is for standard steel casement windows only, and is secured in position by expansion action produced by a nut on one end of each bar.

Science News Letter, July 30, 1949

PORTABLE ELECTRIC radiator for heating resembles an ordinary steam radiator but contains no water or steam. Heating elements are fully enclosed, and its convenient carrying handle can be folded over to provide a drying rack for small articles of wear.

Science News Letter, July 30, 1949

TWO-MAN PUP TENT, made of nylon fabric, is designed for sportsmen and is dome-shaped with a perimeter of nearly 26 feet. Weighing only 9.5 pounds, it fits over an aluminum frame, making pitching and striking the tent a matter of a few minutes. It keeps out water, wind and insects.

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GUARD RAILS for a youngster's bed are triple-bar devices attached in a horizontal position by metal uprights that may be quickly clamped to the wooden rails on each side of the bed. Easily disassembled, they are of value to travelers spending a night where special beds for children are not available.

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Do You Know?

The *water tupelo*, a tree of southern swamps, grows in locations which are under water for a large part of the year; it sometimes attains a height of 100 feet and a low trunk diameter of three to four feet.

If *Alaska's water resources* were properly harnessed they could produce over 8,000,000 kilowatts of electricity, or about one half as much as the present output in the United States proper.

Alfalfa stands at the head of the list of all common hay crops because of its high yield per acre, its value in protein, its high calcium content and its value as a source of several important vitamins.

A promising feature in the construction of *dry cells* for electrical uses is the substitution of magnesium for the zinc now employed; there are many uses for zinc and the supply is not plentiful, while the magnesium supply is unlimited.